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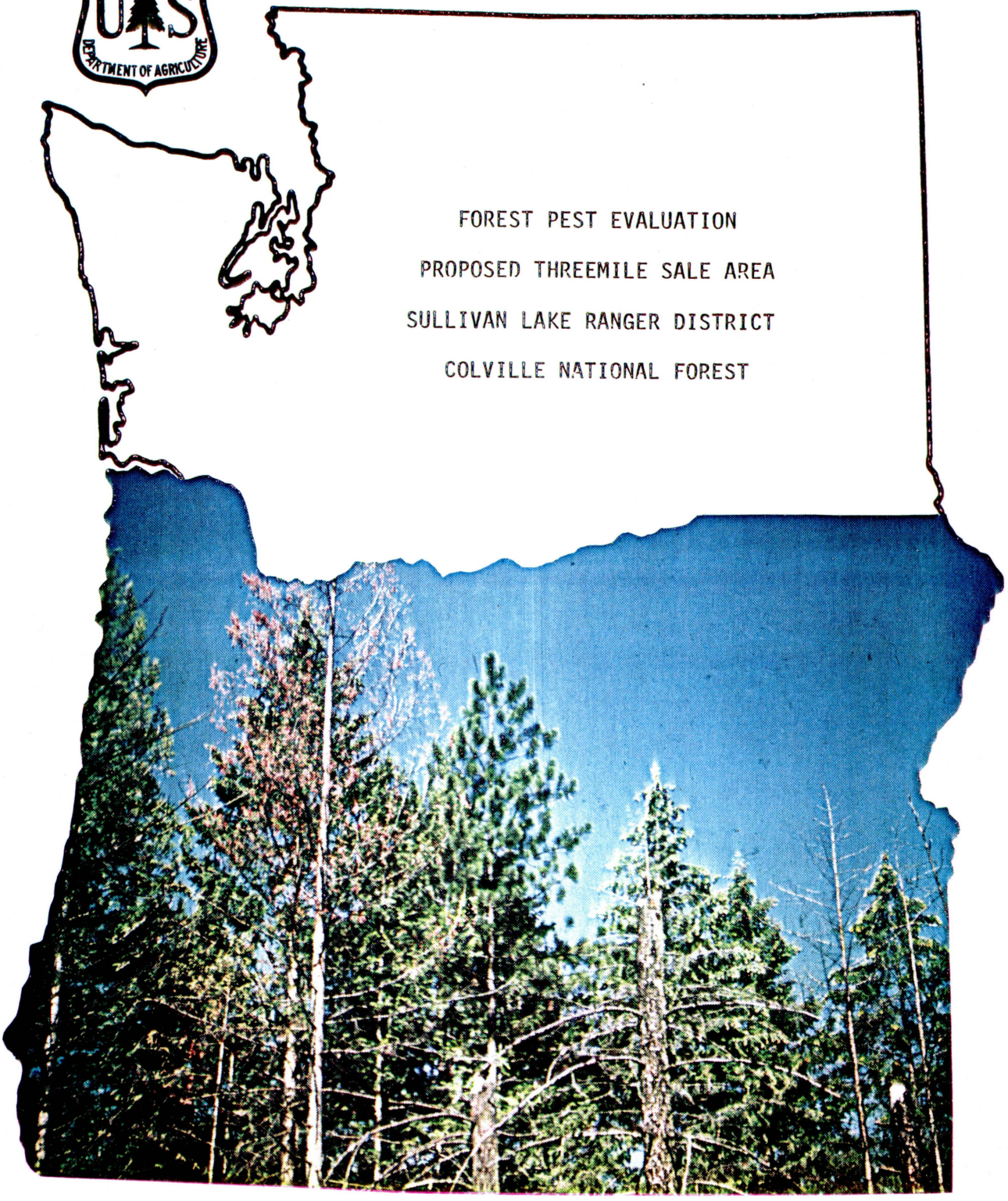
Forest Pest Management
Pacific Northwest Region



FOREST PEST EVALUATION

PROPOSED THREEMILE SALE AREA

SULLIVAN LAKE RANGER DISTRICT

COLVILLE NATIONAL FOREST

Forest Pest Evaluation
Proposed Threemile Timber Sale
Sullivan Lake Ranger District
Colville National Forest

By

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Introduction

On September 11 through 18, 1985, Forest Pest Management personnel did a biological evaluation of stands in the proposed Threemile Timber Sale (T. 65 N., R. 44 E., secs. 29, 30, 32; T. 65 N., R. 43 E., sec. 36; T. 64 N., R. 43 E., secs. 1, 12, 13, 14, 23; and T. 64 N., R. 44 E., secs. 5, 6, and 7). Approximately 4,600 acres are included in the sale area (Figure 1). Purposes of the evaluation were to identify pests damaging stands, ascertain what hosts are being affected, quantify losses in proposed harvest units, and develop pest management recommendations for incorporation in revised silvicultural prescriptions. The evaluation was requested by Ismael Caballaro, Timber Management Assistant on the District.

Site and Stand Characteristics

The proposed Threemile Timber Sale is located 3 miles north of the Sullivan Lake Ranger Station. It encompasses the area between Road 180 and the ridge dividing Threemile Creek from North Fork Sullivan Creek. Elevation ranges from 2,600 to 4,200 feet. Slopes vary from gentle to steep, averaging 35 to 40 percent. The area has limited access, though a trail system serves part of it. The area will be accessed by new roads if the timber sale is completed. Sale unit layout, timber marking, and road location were done 4 years ago, but most field markings are still in good condition. Twenty-four harvest units are currently in the planned sale (Figure 2).

Stands in the proposed sale area are mostly unentered, although one young plantation originating from a clearcut is present. Some light salvage logging has been done near roads along the western margin of the area. Stands are mostly 65 to 70 years old, having originated after the 1910 Burn. A few older stands that escaped major fires occur in creek bottoms. Stands are mainly of mixed composition, with components of Douglas-fir, western larch, grand fir,

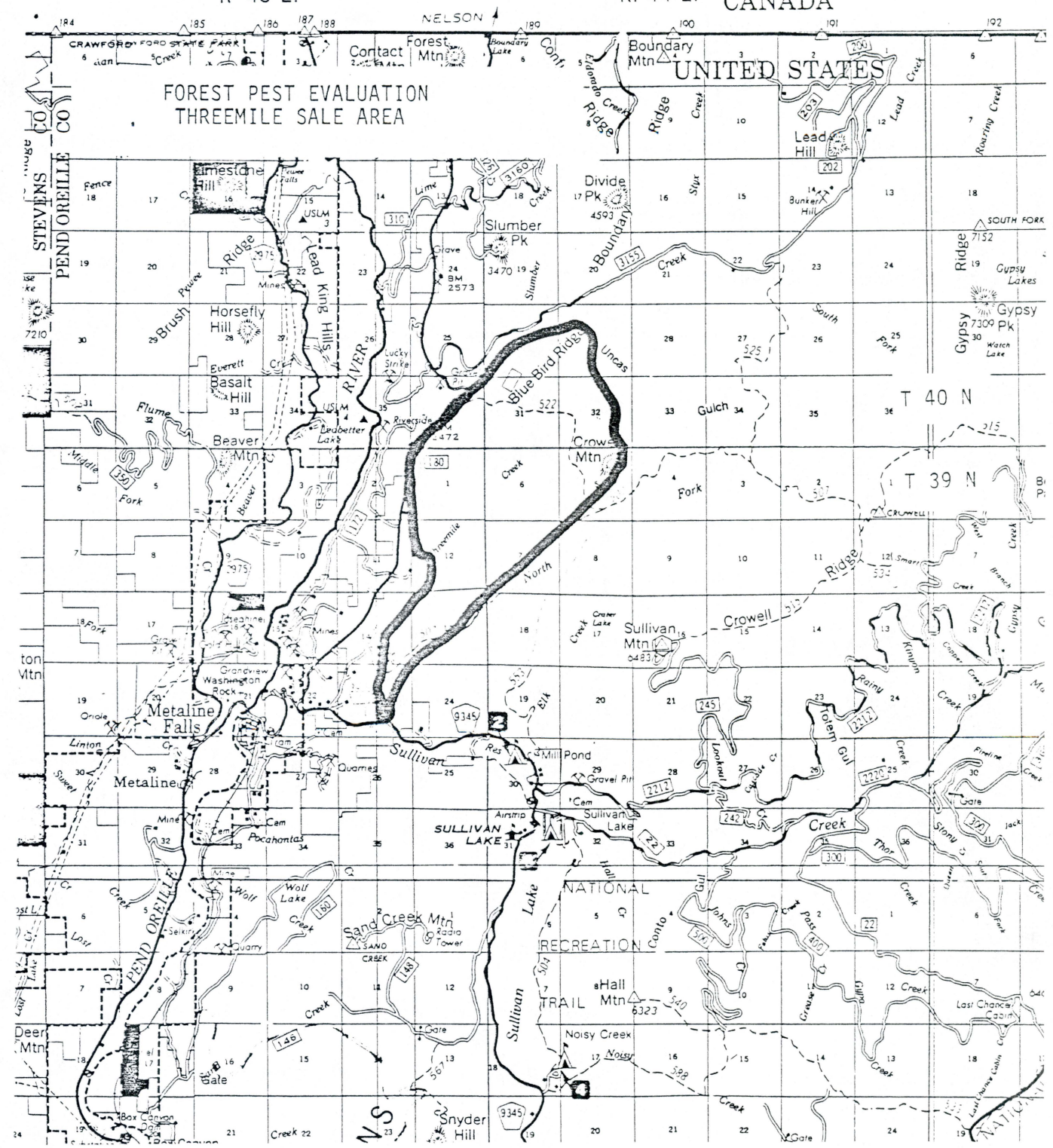

Figure 1. Map depicting location of the survey area, Sullivan Lake Ranger District, Colville NF

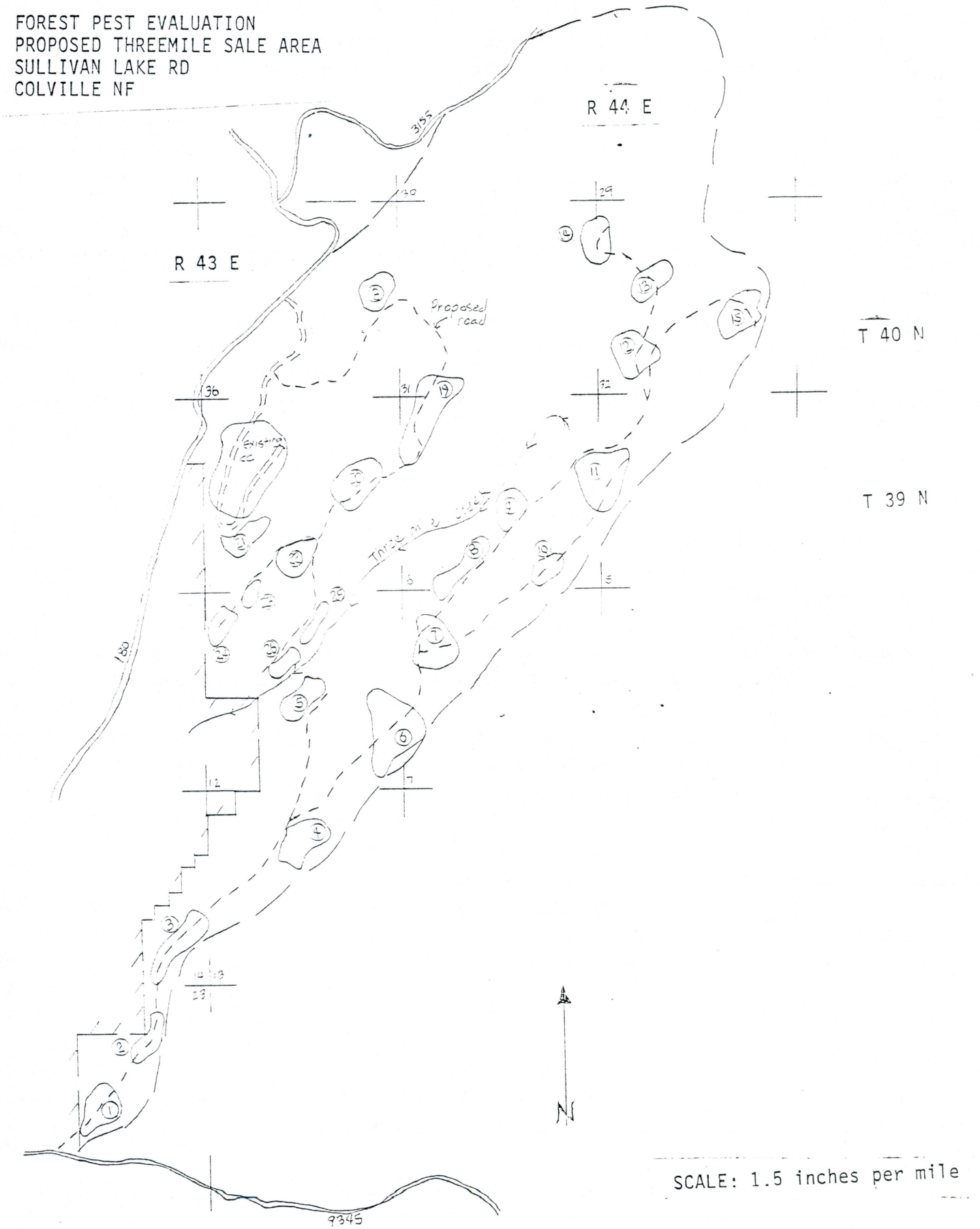
FOREST PEST EVALUATION
PROPOSED THREEMILE SALE AREA
SULLIVAN LAKE RD
COLVILLE NF
R 44 E
R 43 E
T 40 N
T 39 N
proposed road
existing cc
Three Mile Creek
355
180
9345
SCALE: 1.5 inches per mile

Figure 2

lodgepole pine, ponderosa pine, western redcedar, western white pine, western hemlock, and Engelmann spruce.

Methods

Each of the proposed 24 units was surveyed for pest-caused damage. Ten variable radius plots (BAF 40) were located at 2-chain intervals along transects placed systematically within each unit. Each plot was inspected for dead or declining trees affected by diseases or insects. Dead trees and trees exhibiting disease symptoms were examined to determine the causal pest. This involved: (a) removing a section of bark from the boles of dead trees to check for bark beetles or their galleries, (b) on dead and declining trees, removing a section of bark on one or more sides of the root collar and exposing and dissecting portions of one or more large roots to check for stained or decayed wood or mycelium of root disease fungi, and (c) checking crowns and boles of all trees for evidence of stem diseases and dwarf mistletoe infections. The following data were recorded for each plot tree: species, DBH, general condition (live, dead, standing, down), and presence of insects or diseases, if any. From this information, mean basal area and number of trees per acre were calculated.

Results

Tables 1 through 9 summarize basal area and trees per acre by tree condition, DBH class, and pests for all surveyed units. Most stands were suffering unusually high levels of pest-caused damage, due largely to root diseases and bark beetles. Twenty-three percent of the total square foot basal area per acre (SFBAPA) on all units was dead. Also, basal area (both living and dead) averaged only 80 percent as much in root-diseased portions of the stands as it did in healthy parts.

Douglas-fir was the dominant tree species in the surveyed areas (Table 1). It was also the species most severely damaged by root diseases. Armillaria root disease, caused by Armillaria ostoyae, was found affecting 24.2 square feet of the Douglas-fir BAPA, representing 20 percent of the total Douglas-fir basal area. Furthermore, basal area of live Douglas-fir in plots containing at least one tree infected with A. ostoyae was only 52.4 percent of that in healthy plots. Schweinitzii butt rot, caused by Phaeolus schweinitzii, also damaged Douglas-fir; 4.7 SFBAPA were infected and dead. However, many of these trees also were infected by A. ostoyae.

The lodgepole pine component of surveyed stands had been severely damaged by mountain pine beetles (Dendroctonus ponderosae). Dead lodgepole accounted for 2.3 SFBAPA, while only 4.4 SFBAPA of healthy lodgepole remained (Table 2). A small portion of lodgepole pine killed by mountain pine beetles was also infected by A. ostoyae.

Western white pine too was severely damaged by pests. Many dead trees exhibited evidence of both A. ostoyae infection and mountain pine beetle infestation. Some, but not all, of these trees were probably infected by A. ostoyae following death caused by the beetles. White pine blister rust, caused

by Cronartium ribicola, was identified only on a small number of live-infected trees. Some trees killed by mountain pine beetles or Armillaria root disease may have also been infected by C. ribicola, but evidence of past rust infections on trees dead for several years is often impossible to detect. Healthy white pines averaged 2.6 SFBAPA. Basal area of dead white pines infected by A. ostoyae averaged 7.7 SFPA, and those infested by mountain pine beetles averaged 13.5 SFPA (Table 3).

Several tree species were not seriously affected by pests. Western larch made up a significant proportion of the stocking in most surveyed stands and was largely healthy. Larch dwarf mistletoe (Arceuthobium laricis) had caused some mortality, 1.2 SFBAPA, but damage was concentrated in a few discrete areas. Larch also suffered minor damage due to Armillaria root disease and schweinitzii butt rot. The former was found affecting 0.2 SFBAPA of live trees and 0.5 SFBAPA of dead trees, while the latter was detected on dead trees averaging 0.2 SFBAPA. Basal area of healthy larch was 21.8 SFPA (Table 4). Ponderosa pine were found on only the driest sites in the survey area. All ponderosa pine on plots were healthy; average basal area was 2.1 SFPA (Table 5). Western hemlock was another minor stand component. Healthy basal area was 4.2 SFPA. A small amount of Armillaria root disease (0.4 SFBAPA) was found affecting hemlock (Table 6) and half of the diseased trees were still alive. Western redcedar was most common on wet sites near drainage bottoms, seeps, and north-facing slopes. Healthy redcedar stocking was 27.7 SFBAPA. A minor amount of Armillaria root disease was found on cedars; 0.4 SFBAPA of live-infected and 0.4 SFBAPA of dead-infected trees were identified (Table 7). Healthy grand fir averaged 15.8 SFBAPA; 0.6 SFBAPA were live-infected with A. ostoyae and 0.2 SFBAPA were dead-infected (Table 8). Engelmann spruce was a very minor stand component, usually growing on very wet sites. Healthy basal area averaged 0.6 SFBAPA. No dead or pest-affected spruce were found (Table 9).

Proposed harvest units varied in stand type and, consequently, pest damage. Amount of mortality and disease in live trees are summarized for each proposed unit in Tables 10 through 33. Armillaria root disease was present in most units surveyed. It was identified as affecting at least 24 SFBAPA in 13 of the 24 units surveyed. The most severely affected units were, in decreasing order, 7, 5, 10, 15, 3, 8, 12, 11, 19, 2, 6, 21, and 22. Mountain pine beetle- caused mortality was significant in all stands with a major lodgepole or white pine component. Beetles had killed at least 20 SFBAPA of pines in seven units. These units, in decreasing order of beetle-caused damage, were 7, 15, 8, 12, 6, 23, and 13. Larch dwarf mistletoe affected at least 20 SFBAPA in two stands. These were Units 11 and 13. Schweinitzii butt rot affected at least 20 SFBAPA in three units; these were Units 24, 22, and 26.

Laminated root rot, caused by Phellinus weirii, was found in the survey area but was not identified in plots. Infested sites were found in the southern portion of Unit 9. Several large disease centers also were found south of the unit and above the P-line between Units 9 and 10. Douglas-fir and grand fir were being killed. Western larch, though occurring inside disease centers, was not being killed or exhibiting symptoms of infection. Where it occurs, laminated root rot usually causes very serious damage.

Pest Biology and Identification

Armillaria root disease

Armillaria root disease is caused by A. ostoyae, the same fungal pathogen that had been known for years in the Northwest as A. mellea. Recent taxonomic work indicates that several species of Armillaria exist, and A. ostoyae is the species that attacks Northwest conifers.

Although A. ostoyae is often a weak pathogen that affects stressed or injured trees, in some cases, especially in eastern Oregon and Washington, it is extremely virulent and causes dramatic losses by attacking trees in large centers over extensive areas. In such cases, the vigor of the host is not important in determining susceptibility to mortality. Susceptibility to damage does, however, vary greatly between tree species. Relative susceptibility may also change between species in different localities or habitat types. The species most susceptible to infection and mortality in the surveyed area is Douglas-fir. Trees moderately susceptible to infection and damage include western white pine, western hemlock, and western redcedar. Grand fir and lodgepole pine are somewhat less susceptible. Grand fir, however, has been shown to be more susceptible to A. ostoyae in entered than unentered stands. Its relative susceptibility rating may change with management. Trees tolerant of or resistant to the fungus are ponderosa pine, western larch, and Engelmann spruce.

A. ostoyae is a very efficient saprophyte that survives in stumps, roots, and other buried woody material. The fungus can infect living trees across root contacts or by growing short distances through the soil via string-like structures called rhizomorphs. Spread can be from roots of living or dead trees or stumps, and occurs at a rate of about 1 foot per year. Colonization of partially infected root systems occurs quickly after tree death. Root systems of large stumps or stubs which remain buried may contain viable A. ostoyae for up to 50 years. In plantations or stands that have had selective harvest, mortality frequently occurs around old stumps.

A. ostoyae-infected trees can be identified by several characteristic signs and symptoms. Pole-sized and larger trees will display crown symptoms which usually include some, but not necessarily all, of the following: chlorotic foliage, shortened lateral and terminal leader growth, shortened needle length, reduced needle retention, overall thinning, and production of a distress cone crop. Smaller infected trees usually succumb rapidly, with crown symptoms appearing only a year or two prior to death. Often, small trees die with a full complement of foliage. Most infected trees exhibit copious basal resin flow. Diagnostic evidence of infection by A. ostoyae is the characteristic cream-colored mycelial fans which grow under the bark of the roots and butts of live-diseased or recently killed trees (Figure 3). Rhizomorphs, which appear as black, string-like structures with a white interior 2 to 4 mm across (Figure 4), may sometimes be found on root surfaces of live-infected and recently killed trees, but are most common on trees that have been dead for 3 to 5 years. Since trees are killed by girdling caused by cambium killing at the roots and root collar, they often die standing and topple later as roots decay. A. ostoyae-caused decay is characterized as a spongy, sometimes stringy, white to yellow rot. Characteristic thin black zone lines frequently occur throughout the decayed wood.

Mushrooms of the fungus emerge from the soil around the base of live-infected and dead trees in the autumn. They are most abundant after significant rainfall. Mushrooms are honey-colored, with a stem 2 to 4 inches long, and a cap 2 to 3 inches across. The faint remnants of a ring may sometimes be seen on the upper portion of the stem.

Laminated Root Rot

Laminated root rot, caused by Phellinus weirii, is a common and damaging disease throughout the Northwest. It causes tree death, growth reduction, and loss of stocking on diseased sites. P. weirii rarely, if ever, spreads by spores. Instead, it persists on sites in infected woody material in the soil. The fungus can survive within large roots of stumps and snags for 50 years or more. Spread occurs via mycelial growth when roots of healthy trees contact viable inoculum. Disease centers can expand radially at rates of 1 to 2 feet per year.

Laminated root rot causes tree and stand symptoms similar to other root diseases. Disease centers are recognized by the prevalent occurrence of dead standing and windthrown trees. Live-infected trees may be found exhibiting crown symptoms which include reduced height growth, thinning and chlorotic foliage, and numerous smaller than normal cones. More specific symptoms usually are apparent also. Dead and down trees will often have decayed remnants of the root system called "root-balls". Decayed wood separates readily at the annual rings and has a characteristic laminated appearance. Between delaminating sheets, sterile fungal mycelia called setal hyphae may be found. These resemble reddish-brown whiskers (Figure 5). Delaminated sheets of wood will usually be pitted on both sides. Pits are approximately 2 mm long and 1 mm wide. The disease can be identified on recently killed and live-infected trees by the occurrence of ectotrophic mycelium on the exterior surface of infected roots. Ectotrophic mycelium appears as a grayish, crusty fungus growth. It spreads on the surface of root systems, later penetrates the bark, and attacks woody tissue.

Considerable variation in susceptibility to P. weirii exists among Northwest conifers. The most susceptible species include Douglas-fir and grand fir. These species are readily infected and often die or are windthrown as a result. Intermediately susceptible species include western larch, western hemlock, Engelmann spruce, and in the Inland Empire, western redcedar. These species are not readily killed by P. weirii. They may become infected if they are growing in close association with susceptible species, but damage will usually be restricted to butt decay. Trees tolerant of or resistant to P. weirii include western white, lodgepole, and ponderosa pines. These species can grow in close association with susceptible species and seldom be damaged, although they may occasionally be infected. All hardwoods are immune to infection.

Schweinitzii Butt Rot

In eastern Washington, the Inland Empire, and western Montana, P. schweinitzii frequently causes a root and butt rot of immature-mature timber. Douglas-fir is the most seriously damaged species, although grand fir and western larch are sometimes affected. Pines are seldom affected. In many cases, Armillaria root disease also is found on dead and dying trees with P. schweinitzii. It is believed that trees weakened by P. schweinizii are rendered susceptible to lethal A. ostoyae infections. P. schweinitzii spreads long distances by windborne spores. Infection occurs through wounds and fire scars, and decay development is gradual. Tree-to-tree spread occasionally occurs via root grafts or contacts and through unwounded fine roots in the duff layer. Spread from one generation to another can also occur when roots of regeneration contact or grow close to roots of old, infected stubs or stumps and the fungus colonizes them.

Live, P. schweinitzii-infected trees usually do not exhibit crown symptoms even though extensive butt decay may be present. The only reliable indicator on living trees is the occurrence of the characteristic mushroom. P. schweinitzii mushrooms may grow from the lower bole of an infected tree, but more often they emerge from the duff around the base of the tree above infected roots. They are produced in the late summer and fall, but remnants of the old conks are usually present throughout the year. Conks are brown, velvety, and soft when fresh, changing to a corky, crumbly consistency after they die. Dead, infected trees frequently topple and exhibit a distinct brown cubical rot in the butt and roots.

Mountain Pine Beetle

Mountain pine beetles (D. ponderosae) kill several species of pine by mining the cambial zone and girdling the tree. Populations fluctuate greatly. They usually occur at endemic levels, attacking occasional stressed or weakened trees in stands of lodgepole pine, western white pine, and ponderosa pine. Populations are held in check by predators, parasites, and environmental factors. Population buildup and resulting damage usually occurs when large numbers of host trees become susceptible to attack. This can happen when trees are stressed by various biotic and abiotic factors such as root diseases and drought, but most severe damage occurs when populations build in large expanses of continuous host types that have developed high levels of competitive stress. Overmature (> 80 years old) and overstocked (> 200 SFBAPA) lodgepole pine are especially susceptible to catastrophic damage. Western white pine in mixed-conifer stands is susceptible to mortality after it is 60 years old if it occurs in stands with greater than 150 SFBAPA.

Mountain pine beetle is identified as a contributor to tree death by characteristic long, vertical galleries engraved in both the sapwood surface and the inner bark by the egg-laying adults.

Larch Dwarf Mistletoe

Larch dwarf mistletoe (A. laricis) is a parasitic higher plant. In addition to western larch, A. laricis will occasionally infect lodgepole pine in stands where pines occur under a heavily infected larch overstory. Other tree species are not affected by larch dwarf mistletoe.

Dwarf mistletoes spread by seeds forcibly ejected from capsule-like berries during late summer and fall. Average seed dispersal distance is about 35 feet. Seeds are cast down from infected overstories onto trees in the understory. Following interception of seed by foliage of susceptible species, a new mistletoe plant will develop and mature, producing seeds in 4 to 5 years.

Larch dwarf mistletoe affects its host by diverting water, nutrients, and photosynthates which would normally be assimilated. As a result, infected trees suffer loss of vigor and reduction in growth. Severe infections may cause mortality. Suppressed trees and trees growing on poor sites are in the greatest danger of being killed since their slow height growth allows the dwarf mistletoe to build up in the upper crowns. Witches'-brooms develop on infected branches which die and break off with time, leaving the tree with little more than small tufts of branches for a crown. Trees in this condition usually die within a few years. Mistletoe-infected trees often develop cankers and abnormal stem growths. Along with reduced growth and increased mortality rates, severely infected larch have reduced cone and seed yield.

White Pine Blister Rust

White pine blister rust, caused by C. ribicola, is a serious introduced pest of five-needle pines. It is undoubtedly the most serious disease of western white pine on a regional basis. C. ribicola is a heteroecious rust fungus that requires two hosts to complete its life cycle. In addition to five-needle pines, C. ribicola must have species of currents (Ribes sp.) in the locality to serve as alternate hosts.

C. ribicola has a rather complex life cycle. The delicate, thin-walled sporidia produced on leaves of Ribes are windblown short distances (300 feet or less) and infect pine needles in late summer to early autumn. Cool and humid conditions are required for these spores to germinate and infect the host. Consequently, cool air drainages, basins, and sites on lower portions of slopes have the greatest infection potential. Several years after needle infection, the fungus grows into the branches and produces a spindle-shaped swelling. Blisters (aecia) appear in the spring which contain masses of thick-walled aeciaspores. These can be windblown long distances and infect young Ribes leaves. Over the summer, urediospores are produced that can spread among Ribes, resulting in a buildup of inoculum. Late in the summer or early fall, telia are produced on the undersides of Ribes leaves which, in turn, produce sporidia.

In the past, attempts to control blister rust were made by removing Ribes bushes near stands to be protected. This type of control was generally unsuccessful because of the near impossibility of eradicating all Ribes in an area. Current techniques for control involve selecting and growing stock with a level of genetic resistance matched to the site. Cultural practices such as pruning branches in the lower portions of tree crowns to eliminate branch

infections and sites for potential infection courts may also be effective in some cases but are costly.

White pine blister rust can be identified on pines by observing the orange-colored aecia which emerge along the periphery of cankers. Spindle-shaped resinous swellings on branches are characteristic of blister rust damage and can be used to indicate infection.

Management Recommendations

Stands in the Threemile Sale Area are suffering severe pest-caused damage well above average for the Region. Timber harvest in the stands surveyed should be the first step in an effort to capture losses caused by and reduce future hazard due to diseases and insects. Impacts of all pests encountered in the evaluation can be minimized through implementation of proper harvesting, regeneration, and stocking control prescriptions. Specific recommendations for dealing with each pest are as follows:

Armillaria Root Disease - A. ostoyae is the most common and damaging pest in the evaluation area. The best prescription for minimizing loss caused by Armillaria root disease is to harvest existing affected stands and convert to less-susceptible tree species in the next generation. Intensity and distribution of disease influences preferred treatments in particular units. We suggest the following:

1. In units with distinct Armillaria root disease centers occupying 25 percent or less of the area (Units 1, 9, 14, 20, 21, 22, 24, 25, and 26), (a) Delineate Armillaria root disease centers and a 50-foot buffer around each, (b) harvest the existing stands, (c) regenerate disease pockets and buffers with tree species that show some level of resistance to A. ostoyae and are adapted to the site. Recommended species in decreasing order of preference are ponderosa pine, Engelmann spruce, western larch, lodgepole pine, grand fir, western hemlock, western redcedar, and western white pine. Douglas-fir should not be regenerated in disease pockets under any circumstances. Treated areas can be planted with the desired resistant species following a clearcut. Alternatively, seed tree or shelterwood systems can be used if sufficient numbers of resistant trees occur at the necessary spacing to serve as leave trees, (d) regenerate portions of the units outside of disease pockets and surrounding buffers with any tree species, including Douglas-fir. Establishment of mixed rather than pure stands would be preferable.

2. In units where Armillaria root disease centers occupy more than 25 percent of the area (Units 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 18, 19, and 23), harvest and regenerate the entire area as recommended for the diseased areas in (1) above.

3. Expand units where severe Armillaria root disease occurs adjacent to existing boundaries. Specifically, extend Units 5, 8, and 20 to include additional root disease centers east of the currently marked boundaries. Treat added disease centers in the same fashion as those already incorporated in the units.

Laminated Root Rot - Although not nearly so widely distributed in the evaluation area as A. ostoyae, P. weirii is another serious root pathogen that was encountered. Recommended management for laminated root rot is rather similar to that for Armillaria root disease. Harvest and regenerate root rot pockets and 50-foot buffers around them with tree species that are resistant, tolerant, or intermediately susceptible to P. weirii. Recommended species in decreasing order of preference are ponderosa pine, lodgepole pine, western white pine, western redcedar, western larch, western hemlock, and Engelmann spruce. Species that should be avoided are Douglas-fir and grand fir. Treatment can involve planting resistant, tolerant, or intermediately susceptible tree species after a clearcut or use of such species as leave trees in a seed tree or shelterwood system. Laminated root rot should be treated in Unit 9 of the Threemile Sale. Also, the boundaries of this unit should be extended to the south to include adjacent laminated root rot pockets.

Schweinitzii Butt Rot - Most damage due to P. schweinitzii in the evaluation area involves Douglas-fir and most occurs in areas where Armillaria root disease is also affecting that tree species. Thus, treatment of Armillaria root disease by replacing Douglas-fir with other tree species should serve to control schweintzii butt rot as well. No other specific management activity for this disease is recommended.

Mountain Pine Beetle - D. ponderosae is the most serious pest of pines in the Threemile Sale Area and has already killed much of the lodgepole and western white pine in the surveyed stands. Mountain pine beetle is best managed through a combination of stocking control and use of relatively short rotations. Stands of lodgepole and western white pine should be managed on rotations of 100 years or less and ponderosa pine on rotations of 150 years or less. Stocking in stands containing any of the pines should not exceed 150 SFBAPA and preferably should be even lower (100 to 120 SFBAPA). Stocking levels should be managed through precommercial and commercial thinnings. Prescriptions for new pine stands or mixed stands that contain pine established after harvest in any of the sale units should incorporate these recommendations.

Larch Dwarf Mistletoe - A. laricis is the only serious disease of western larch in the evaluation area. It also affects lodgepole pine. Since larch, in particular, is well adapted to the sites in the Threemile Sale Area, already is present in some numbers, and is quite resistant to the Armillaria root disease that affects many of the stands, it is a very desirable species for management in the area. Larch would be especially useful in shelterwoods or for seed trees, however, dwarf mistletoe infected overstory trees must be removed promptly following establishment of the understory to minimize spread to the young trees. We recommend that, where mistletoe occurs in existing larch overstories and larch or lodgepole pine are the desired species in the next generation, either (1) units should be clearcut and regenerated by planting, or (2) seed tree or shelterwood systems can be employed, but (a) retain the least severely infected larch as leave trees, and (b) remove all infected leave trees before the new regeneration reaches 10 years of age or 3 feet tall, whichever happens first. Efforts should also be made to insure that cutting boundaries are designed to minimize likelihood of mistletoe reinvasion from surrounding infected stands. Larch dwarf mistletoe management should be a consideration in Units 5, 11, 12, 13, 18, and 22. Larch overstories in other units are not infected.

White Pine Blister Rust - In areas where the disease is a potential problem, white pine blister rust is best managed through use of resistant white pine growing stock. The disease occurs in surveyed stands, alternate hosts are plentiful, and many of the units have the type of site characteristics favorable for the disease (moist creek bottoms, lower slopes, etc.). Therefore, where western white pine is a desired species in the Threemile Sale Area, we recommend that: (1) resistant white pine seedlings screened through the Dorena Project be used for plantings, and (2) where seed trees or shelterwoods are to be used, (a) only white pines that exhibit phenotypic resistance to blister rust be retained as seed trees, and (b) they be retained in a mix with one or more other species.

Figure 3. Cream-colored mycelial fans, characteristic of Armillaria ostoyae

Figure 4. Black, shoestring-like fungal structures called rhizomorphs of Armillaria ostoyae

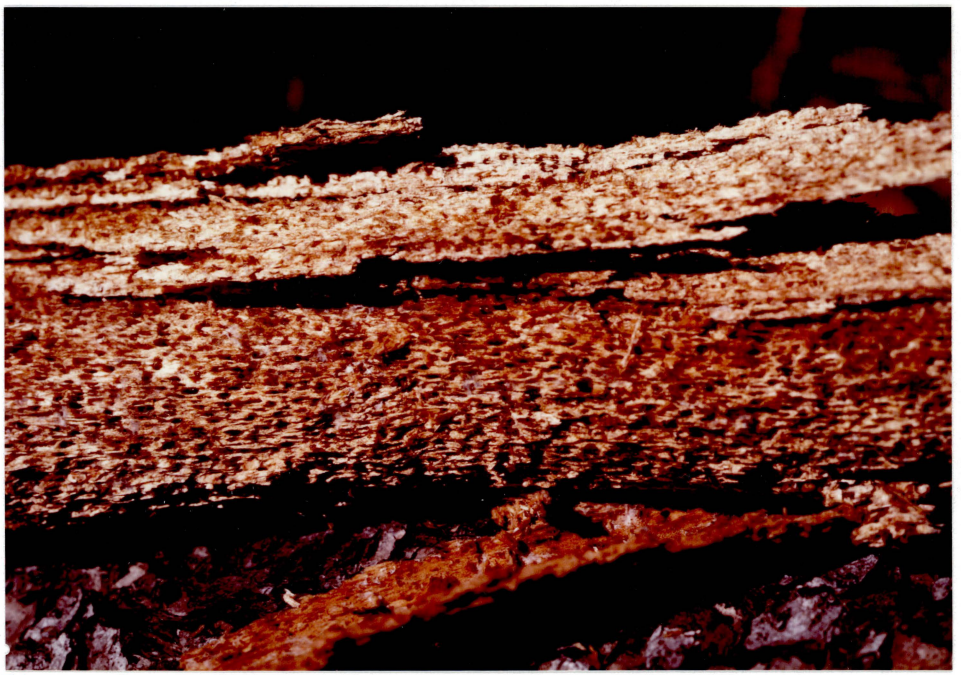

Figure 5. Delaminated, pitted decay and reddish-brown setal hyphae, characteristic of Phellinus weirii

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Table 1. Threemile Planning Area. Douglas-fir Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE				DEAD					
	Healthy		A. ostoyae		A. ostoyae		P. schweinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T
6	2.5	12.5			1.9	9.8	0.2	0.9	1.1	5.4
8	4.6	13.1	0.2	0.5	1.2	3.5	0.2	0.5	0.7	2.0
10	7.9	14.5	0.4	0.6	5.1	9.3	1.6	2.9	1.9	3.5
12	14.2	18.1	1.0	1.3	2.8	3.4	0.9	1.2	1.1	1.3
14	12.6	11.8	1.2	1.2	3.7	3.4	0.7	0.7	1.8	1.6
16	15.1	10.8	1.0	0.8	1.9	1.4	0.7	0.5	1.9	1.1
18	10.7	6.1	0.4	0.2	1.4	0.8	0.2	0.1	0.2	0.1
20	9.7	4.4	0.5	0.2	0.2	0.1	0.2	0.1	0.4	0.2
22	4.4	1.7	0.2	0.1	0.5	0.2	0.2	0.1	0.2	0.1
24	2.5	0.8	0.4	0.1	0.2	0.1			0.2	0.1
26	1.2	0.3								
28	0.5	0.1								
30	0.2	<0.1								
32	0.4	<0.1								
34	<0.1	<0.1								
Tot	86.5	94.3	5.3	5.1	18.9	32.2	4.7	6.8	8.9	15.4

Table 2. Threemile Planning Area. Lodgepole pine Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		D. ponderosae		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	0.2	0.9							0.5	2.7		
8	0.5	1.5					0.2	0.5	0.5	1.5		
10	1.1	1.9							0.4	0.6		
12	1.1	1.3							0.2	0.2		
14	1.1	1.0					0.2	0.2	0.4	0.3		
16	0.4	0.3							0.2	0.1		
18	0.2	0.1							0.2	0.1		
20												
Tot	4.4	7.0					0.4	0.7	2.3	5.6		

Columns may not sum due to rounding

Table 3. Threemile Planning Area. Western White Pine Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		C. ribicola		A. ostoyae		D. ponderosae		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	0.2	0.9					0.4	1.8				
8	0.2	0.5			0.2	0.5	0.5	1.5	0.7	2.0	0.7	0.2
10	0.5	1.0					1.1	1.9	4.0	7.4		
12	0.2	0.2			0.2	0.2	2.3	2.9	3.5	4.5		
14	0.7	0.7					1.6	1.5	2.3	2.1		
16	0.2	0.1					1.4	1.0	1.6	1.1		
18	0.5	0.3			0.2	0.1	0.3	0.2	1.4	0.8	0.2	0.1
20	0.2	0.1										
22					0.2	0.1	0.2	0.1				
24												
Tot	2.6	3.8			0.8	0.9	7.7	10.9	13.5	17.9	0.9	0.3

Table 4. Threemile Planning Area. Larch Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD							
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schweinitzii		dwarf mistletoe		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	0.7	3.6									0.4	1.8		
8	0.9	2.5			0.4	1.0	0.2	0.5			0.2	0.5		
10	3.0	5.5			0.4	0.6					0.2	0.3	0.5	1.0
12	6.1	7.8			0.4	0.5	0.2	0.2					0.2	0.2
14	4.7	4.4	0.2	0.2	0.5	0.5					0.4	0.3		
16	3.5	2.5					0.2	0.1						
18	1.0	0.6											0.2	0.1
20	1.6	0.7			0.2	0.1			0.2	0.1				
22	0.2	0.1									0.2	0.1		
24														
Tot	21.8	27.7	0.2	0.2	1.8	2.7	0.5	0.9	0.2	0.1	1.2	3.0	1.1	1.4

Table 5. Threemile Planning Area. Ponderosa pine Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schweinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6												
8												
10												
12												
14												
16	0.2	0.1										
18	0.4	0.2										
20	0.7	0.3										
22	0.5	0.2										
24	0.4	0.1										
26	0.4	0.1										
28												
Tot	2.5	1.1										

Table 6. Threemile Planning Area. Western Hemlock Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schweinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	0.9	4.5										
8	0.5	1.5	0.2	0.5								
10	0.5	1.0										
12	0.7	0.9					0.2	0.2				
14	0.5	0.5										
16	0.7	0.5										
18	0.4	0.2										
20												
Tot	4.2	9.0	0.2	0.5			0.2	0.2				

Table 7. Threemile Planning Area. Western Redcedar Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	P. schweinitzii ba	P. schweinitzii T	Misc. Dead ba	Misc. Dead T
6	4.4	22.4										
8	4.9	14.1					0.2	0.5			0.2	0.5
10	3.7	6.8										
12	4.0	5.1										
14	3.0	2.8	0.2	0.2			0.2	0.2			0.2	0.2
16	2.8	2.0										
18	1.4	0.8										
20	0.5	0.2	0.2	0.1								
22	1.2	0.5										
24	0.5	0.2										
26	0.7	0.2										
28	0.2	0.1										
30												
32	0.2	<0.1										
34	0.2	<0.1										
Tot	27.7	55.1	0.4	0.3			0.4	0.7			0.4	0.7

Table 8. Threemile Planning Area. Grand Fir Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	P. schweinitzii ba	P. schweinitzii T	Misc. Dead ba	Misc. Dead T
6	1.9	9.8										
8	1.7	5.3										
10	2.6	4.8										
12	2.8	3.6										
14	1.8	1.6	0.2	0.2			0.2	0.2				
16	1.1	0.8										
18	1.4	0.8										
20	1.4	0.6	0.2	0.1								
22	0.2	0.3	0.2	0.1								
24	0.4	0.1										
26												
Tot	15.3	27.5	0.6	0.4			0.2	0.2				

Table 9. Threemile Planning Area. Engelmann Spruce Basal Area and Stems per Acre by Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schweinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6												
8												
10												
12												
14	0.2	0.2										
16	0.2	0.1										
18	0.2	0.1										
20												
Tot	0.6	0.4										

Table 10. Threemile Unit 1. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schwinitzii		D. ponderosae	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6												
8	8	22.9										
10	4	7.3										
12	8	10.2										
14	20	18.7										
16	32	22.9										
18	4	2.3										
20	20	9.2										
22												
24	8	2.6										
Total	104	96.1										

a minor amount of armillaria root disease is present in Unit 2 that was not identified in stand exam plots.

Table 11. Threemile Unit 2. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schwinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	4	20.4										
8	12	34.4					4	11.5				
10	32	58.7										
12	32	40.8					4	5.1			4	5.1
14	28	26.2					8	7.5				
16	12	8.6										
18	28	15.9	4	2.3			8	4.5				
20	8	3.7	4	1.8								
22	8	3.0										
24	4	1.3										
26	4	1.1										
28												
Total	172	214.0	8	4.1			24	28.6			4	5.1

Table 12. Threemile Unit 3. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	P. schwinitzii ba	P. schwinitzii T	Misc. Dead ba	Misc. Dead T
6	4	20.4					4	20.4				
8	28	80.3					4	11.5				
10	24	44.0					12	22.0			4	7.3
12	36	45.9	4	5.1			12	15.3				
14	44	41.2	4	3.7			16	15.0				
16	12	8.6					4	2.9				
18	16	9.1										
20												
22												
24	4	1.3										
26												
28	4	1.0										
30												
Total	172	251.5	8	8.8			52	87.0			4	7.3

Table 13. Threemile Unit 4. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	DEAD: A. ostoyae ba	A. ostoyae T	P. schwinitzii ba	P. schwinitzii T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	16	81.5			4	20.4						
8	12	34.4	4	11.5								
10	28	51.4			8	14.7	4	7.3				
12	48	61.2			12	15.3						
14	32	30.0	4	3.7								
16	36	25.8							4	3.7		
18	16	9.1			4	2.3						
20	12	5.5										
22	16	6.1										
24												
26	4	1.1										
28												
Total	220	305.9	8	15.2	28	52.7	4	7.3	4	3.7		

Table 14. Threemile Unit 5. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		D. ponderosae		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	4	20.4										
8	8	22.9									4	11.5
10	4	7.3					8	14.7	8	14.7		
12	8	10.2					8	10.2	8	10.2		
14	16	15.0	4	3.7	4	3.7	24	22.5				
16	12	8.6					12	8.6				
18	16	9.1			4	2.3	4	2.3				
20	36	16.5										
22	8	3.0	4	1.5	4	1.5	4	1.5				
24	4	1.3	4	1.3							4	1.3
26	8	2.2										
28												
Total	124	116.5	12	6.5	12	6.5	60	59.7	16	24.9	8	12.8

Table 15. Threemile Unit 6. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		D. ponderosae		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	24	122.3							4	20.4		
8	16	45.9					4	11.5	4	11.5		
10	16	29.4					4	7.3	4	7.3	4	7.3
12	28	35.7										
14	12	11.2					4	3.7				
16	16	11.5					4	2.9	4	2.9		
18	20	11.3					8	4.5	8	4.6		
20	20	9.2										
22	4	1.5										
24												
26												
Total	156	278.0					24	29.9	24	46.7	4	7.3

Table 16. Threemile Unit 7. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	C. ribicola ba	C. ribicola T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	8	40.8					4	20.4				
8	20	57.3										
10	28	51.4					8	14.7	16	29.4		
12	32	40.8	4	5.1			20	25.5	32	40.8		
14	44	41.2	4	3.7			12	11.2	12	11.2		
16	44	31.5	12	8.6			28	20.1	32	22.9		
18	24	13.6	4	2.3	4	2.3	12	6.8	8	4.5	8	4.5
20	28	12.8	12	5.5								
22	12	4.6	4	1.5	4	1.5						
24	8	2.6					4	1.3				
26												
Total	248	296.5	40	26.7	8	3.8	88	99.9	100	108.8	8	4.5

Table 17. Threemile Unit 8. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	P. schweinitzii ba	P. schweinitzii T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	4	20.4										
8	4	11.5							4	20.4		
10	16	29.4			4	7.3	4	7.3	4	11.5		
12	12	15.3					8	10.2	8	14.7		
14	16	15.0	4	3.7			4	3.7	8	10.2		
16	24	17.2			4	2.9	16	11.5	12	11.2		
18	12	6.8					8	4.5	4	2.9		
20	20	9.2					4	1.8				
22	16	6.1	8	3.0					4	1.5		
24	16	5.1	4	1.3								
26	4	1.1										
28	4	1.0										
30												
Total	148	137.8	16	8.0	8	10.2	44	39.1	44	72.3		

Table 18. Threemile Unit 9. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	20	101.9										
8	20	57.3							4	11.5	4	11.5
10	16	29.4										
12	20	25.5							4	5.1	8	10.2
14	4	3.7					4	3.7	4	3.7		
16	24	17.2									4	2.9
18	28	15.6					4	2.3	4	2.3		
20	28	12.8										
22	8	3.0										
24	8	2.6										
26	8	2.2										
28												
Total	184	271.5					8	6.0	16	22.6	12	24.6

Table 19. Threemile Unit 10. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	20	101.9					12	61.2				
8	4	11.5					20	57.3	4	11.5	4	11.5
10	12	22.0					4	7.3	8	14.6		
12	32	40.8	12	15.3			8	10.2	4	5.1		
14	32	30.0										
16	16	11.5										
18	8	4.5										
20	8	3.7										
22												
24												
Total	132	225.8	12	15.3			44	136.0	16	31.2	4	11.5

Table 20. Threemile Unit 11. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

	LIVE								DEAD							
			A.		C.		dwarf		A.		D.		dwarf		Misc.	
DBH	Healthy		ostoyae		ribicola		mistletoe		ostoyae		ponderosae		mistletoe		Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	20	101.9							12	61.2			4	20.4		
8	20	57.3					4	11.5	12	34.4			4	11.5	4	11.5
10	20	36.7							16	29.4	8	14.6	4	7.3	4	7.3
12	32	40.8			4	5.1					4	5.1				
14	28	26.2	4	3.7			4	3.7	4	3.7						
16	32	22.9	4	2.9												
18	4	2.3														
20	4	1.8														
22																
Tot	160	289.9	8	6.6	4	5.1	8	15.2	44	128.6	12	19.7	12	39.2	8	18.8

Table 21. Threemile Unit 12. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

	LIVE						DEAD					
			A.		dwarf		A.		D.		Misc.	
DBH	Healthy		ostoyae		mistletoe		ostoyae		ponderosae		Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	12	61.2					4	20.4				
8	20	57.3	4	11.5			4	11.5	4	11.5	4	11.5
10	16	29.4			4	7.3	20	36.7	24	44.0	4	7.3
12	32	40.8	4	5.1			8	10.2	8	10.2		
14	40	37.4					4	3.7	4	3.7		
16	16	11.5	8	5.8								
18												
20												
22	4	1.5										
24												
26												
Tot	140	239	16	22.4	4	7.3	40	82.5	40	69.4	8	18.8

Table 22. Threemile Unit 13. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

	LIVE				DEAD							
			dwarf		A.		D.		dwarf		Misc.	
DBH	Healthy		mistletoe		ostoyae		ponderosae		mistletoe		Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	8	40.8							4	20.4		
8	12	34.4			4	11.5						
10	36	66.0	4	7.3							4	7.3
12	40	51.0	4	5.1								
14	8	7.5	4	3.7			8	7.4	8	7.4	4	3.7
16	24	17.2					4	2.9			4	2.9
18					4	2.3	8	4.6				
20												
22					4	1.5	4	1.5				
24												
26												
Tot	128	216.8	12	16.1	12	15.3	20	14.9	16	29.3	12	13.9

Table 23. Threemile Unit 14. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

	LIVE						DEAD					
			A.		dwarf		D.		P.		Misc.	
DBH	Healthy		ostoyae		mistletoe		ponderosae		schwinitzii		Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6							4	20.4			8	40.8
8												
10	40	73.4					4	7.3	4	7.3		
12	52	66.2					4	5.1				
14	20	18.7										
16	28	20.1										
18	20	11.3										
20	8	3.7										
22												
24	4	1.3										
26												
Total	172	194.7					12	32.8	4	7.3	8	40.8

Table 24. Threemile Unit 15. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6									13	67.9		
8												
10	40	73.4							13	24.5	13	24.5
12	80	101.9	13	17.0			13	17.0	13	17.0		
14	53	49.9					13	12.5	13	12.5		
16	13	10.0										
18			13	7.6								
20			13	6.1								
22												
Tot	186.6	234.8	40	30.7			26	29.5	52	121.9	13	24.5

Table 25. Threemile Unit 18. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	A. ostoyae ba	A. ostoyae T	dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	D. ponderosae ba	D. ponderosae T	Misc. Dead ba	Misc. Dead T
6	28	142.7										
8	28	80.3					4	11.5	4	11.5		
10	20	36.7					4	7.3			4	7.3
12	52	66.2			4	5.1	4	5.1				
14	24	22.5	4	3.7	4	3.7						
16	24	17.2										
18	28	15.9										
20	4	1.8										
22												
Tot	208	383.2	4	3.7	8	8.8	12	23.9	4	11.5	4	7.3

Table 26. Threemile Unit 19. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE				DEAD							
	Healthy		A. ostoyae		P. schweinitzii		A. ostoyae		D. ponderosae		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	12	61.2										
8	12	34.4					4	11.5	4	11.5	4	11.5
10	4	7.3	4	7.3			8	14.6				
12	4	5.1			4	5.1	8	10.2	8	10.2		
14	8	7.5	4	3.7			4	3.7	4	3.7		
16			8	5.8								
18	16	9.1										
20	4	1.8	4	1.8								
22												
Total	60	126.4	20	18.6	4	5.1	24	40.0	16	25.4	4	11.5

Table 27. Threemile Unit 20. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE						DEAD					
	Healthy		A. ostoyae		dwarf mistletoe		A. ostoyae		P. schwinitzii		Misc. Dead	
	ba	T	ba	T	ba	T	ba	T	ba	T	ba	T
6	24	122.3										
8	32	91.7									8	22.9
10	24	44.0									40	73.4
12	32	40.8					8	10.2				
14	8	7.5										
16	8	5.7										
18	8	4.5										
20	8	3.7										
22	8	3.0										
24												
34	8	1.3										
Total	8	1.3					8	10.2			48	96.3

Table 28. Threemile Unit 21. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	LIVE: Healthy T	LIVE: A. ostoyae ba	LIVE: A. ostoyae T	LIVE: dwarf mistletoe ba	LIVE: dwarf mistletoe T	DEAD: A. ostoyae ba	DEAD: A. ostoyae T	DEAD: D. ponderosae ba	DEAD: D. ponderosae T	DEAD: Misc. Dead ba	DEAD: Misc. Dead T
6	16	81.5					4	20.4			4	20.4
8	16	45.9							4	11.5	4	11.5
10	12	22.0					8	14.6	4	7.3		
12	8	10.2					8	10.2	4	5.1		
14	12	11.2					4	3.7	4	3.7		
16	12	8.6										
18	20	11.3										
20	20	9.2										
22	20	7.6										
24	8	2.6										
26	8	2.2										
28	4	1.0										
30												
32	4	0.7										
34	4	0.6										
Tot	164	214.5					24	48.9	16	27.6	8	31.9

Table 29. Threemile Unit 22. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	LIVE: Healthy T	LIVE: A. ostoyae ba	LIVE: A. ostoyae T	LIVE: dwarf mistletoe ba	LIVE: dwarf mistletoe T	DEAD: A. ostoyae ba	DEAD: A. ostoyae T	DEAD: P. schwinitzii ba	DEAD: P. schwinitzii T	DEAD: Misc. Dead ba	DEAD: Misc. Dead T
6	8	40.8										
8	4	11.5			4	11.5			4	11.5		
10	12	22.0	4	7.3			4	7.3	8	14.6		
12	40	60.0					4	5.1			8	10.2
14	24	22.5	4	3.7					4	3.7	12	11.1
16	36	25.8					4	2.9			4	2.9
18	12	6.8	4	2.3					4	2.3		
20	16	7.3			4	1.8						
22	8	3.0										
24	8	2.6										
26	12	3.3										
28												
30	4	0.8										
32	8	1.4										
34												
Tot	192	198.7	12	13.3	8	13.3	12	15.3	20	32.1	24	19.1

Table 30. Threemile Unit 23. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	LIVE: A. ostoyae ba	A. ostoyae T	LIVE: C. ribicola ba	C. ribicola T	DEAD: A. ostoyae ba	A. ostoyae T	DEAD: D. ponderosae ba	D. ponderosae T	DEAD: Misc. Dead ba	Misc. Dead T
6	12	61.2									4	20.4
8	32	91.7			4	11.5					4	11.5
10	24	44.0							20	36.7		
12	16	20.4							8	10.2		
14	16	15.0					4	3.7	12	11.2	8	7.4
16	24	17.2									8	5.8
18	12	6.8										
20	4	1.8										
22												
Tot	140	258.1			4	11.5	4	3.7	40	58.1	24	45.1

Table 31. Threemile Unit 24. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	Healthy T	LIVE: A. ostoyae ba	A. ostoyae T	LIVE: dwarf mistletoe ba	dwarf mistletoe T	DEAD: A. ostoyae ba	A. ostoyae T	DEAD: P. schwinitzii ba	P. schwinitzii T	DEAD: Misc. Dead ba	Misc. Dead T
6	8	40.8										
8												
10	8	14.7					4	7.3	4	7.3	16	81.5
12	24	30.6					4	5.1	12	15.3		
14	12	11.2	4	3.7			8	7.5	8	7.5	12	22.0
16	20	14.3									8	10.2
18	32	18.1									4	3.7
20	32	14.7										
22	4	1.5										
24	4	1.3										
26												
Tot	144	147.2	4	3.7			16	19.9	24	30.1	48	14.3

Table 32. Threemile Unit 25. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	LIVE: Healthy T	LIVE: A. ostoyae ba	LIVE: A. ostoyae T	LIVE: dwarf mistletoe ba	LIVE: dwarf mistletoe T	DEAD: A. ostoyae ba	DEAD: A. ostoyae T	DEAD: D. ponderosae ba	DEAD: D. ponderosae T	DEAD: Misc. Dead ba	DEAD: Misc. Dead T
6											8	40.8
8	12	34.4									4	11.5
10	24	44.0					8	14.6				
12	36	45.9										
14	44	41.2										
16	20	14.3										
18	16	9.1										
20	12	5.5										
22	12	4.6										
24												
26												
28	4	0.9										
30												
Tot	180	199.8					8	14.6			12	52.3

Table 33. Threemile Unit 26. Basal Area and Trees per Acre by Tree Condition, DBH Class and Pest

DBH	LIVE: Healthy ba	LIVE: Healthy T	LIVE: A. ostoyae ba	LIVE: A. ostoyae T	DEAD: P. schweinitzii ba	DEAD: P. schweinitzii T	DEAD: A. ostoyae ba	DEAD: A. ostoyae T	DEAD: D. ponderosae ba	DEAD: D. ponderosae T	DEAD: Misc. Dead ba	DEAD: Misc. Dead T
6					8	40.8	8	40.8				
8											4	11.5
10	8	14.7					4	7.3				
12	16	20.4			4	5.1			4	5.1	4	5.1
14	36	33.7					8	7.5				
16	60	43.0									12	8.6
18	28	15.9										
20	32	14.7									8	3.7
22	20	7.6									4	1.5
24												
Tot	200	149.9			12	45.9	20	55.6	4	5.1	40	37.8